Part II

Contradictory Doctrines of Functional Anatomy, of the Masticatory Organ, Occlusion and Tooth Angulations

Group A : Doctrine of

- Official Functional Anatomy,
- Evolution
- General dentistry
- Bio-Functional Orthodontics, BFO,

in contrast to

Group B: Doctrine of

- General orthodontics by
  Straight Wire Anatomy of: “The six keys of occlusion”
  [L. F. Andrews, based on 120 ideal plaster models.]

Part II A

Group - A - the Official Doctrine of :

Functional Anatomy, General Dentistry and Bio-Functional Orthodontics, BFO for:

- the angulation of teeth
- the shape of occlusion
- the functional coordination of:
  teeth, bone, growth, TMJ, muscles, innervation, blood supply

II. A.1. Definition of tooth inclinations and occlusal curve, Lateral view of Occlusion

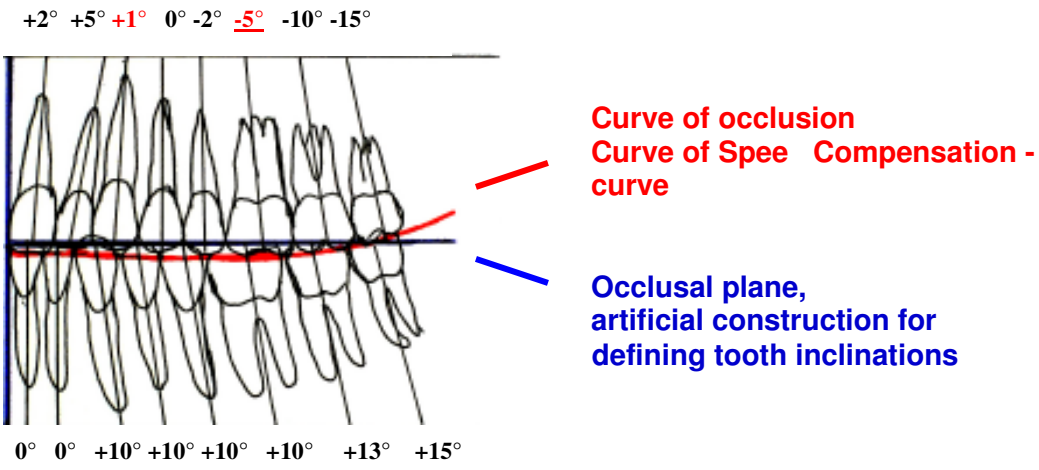
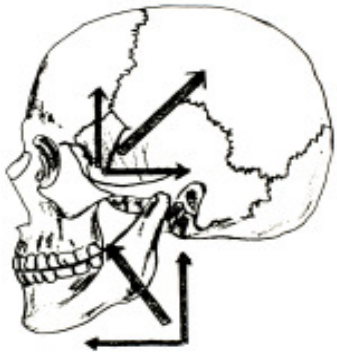


Fig. 6 Official anatomy, definition of tooth inclinations and occlusal curve by occlusal plane . Note the angulation of maxillary first molar of –5°.

[**Schumacher, G.-H.**, Die Funktionelle Anatomie des orofazialen Systems, Hüthig Verlag, Heidelberg, 1985]

II. A.2. The Curve of Spee / Compensation curve in relation to main force vectors of masticatory muscles



a) As a result of Evolution

[Deutsche Gesellschaft für Kieferorthopädie, DGKFO, 1963, G.-H. Schumacher 1985, 1997 in: Die Evolution der Zähne, Quintessenz-Verlag]

b) As a mechanical adaptation to masticatory activities **[G.-H. Schumacher 1993/97]**

Fig. 7: The functional coordination of hardware and software
The main force vectors of muscles of mastication in coordination with the Curve of Spee and molar angulations, perpendicular to Curve of Spee and in line with long axis of molars.

The principles of the Curve of Spee, G.-H. Schumacher:

The principle of the Curve of Spee consists in:

- *to bring the occlusal plains of the upper and lower molars – being in the main force vector of masticatory muscles - into a for the function optimal inclination and position to each other.*
  This will be achieved only, when the occlusal plains of the molars are angulated rectangular to the main vector of masticatory force vectors. By this, the roots of the molars are stressed / loaded linear to their long axis.
- ***Findings of G.-H. Schumacher 1961 showed, that the force vector of m. temporalis, m. masseter and m. pterygoideus lateralis is not perpendicular to a straight occlusal plane, but diagonal.*** **[G.-H. Schumacher, 1997]**
- *The curvature of the Curve of Spee / Compensation Curve provides, that the muscles of mastication are able to fulfil additionally:*

  adduction,
  protraction,
  retraction and
  laterotrusion." **see Fig. : 6 and 7** [G.- H. Schumacher 1997, Die Evolution der Zähne]

A straightening of the Curve of Spee by orthodontic straight wire technique will damage the functional organization of teeth and muscles, causing complex dysfunction of the organ of mastication and the craniomandibular system.

II. A. 3. The Evolution of the Curve of Spee and functional occlusion

- The homo sapiens is characterized by the so called Curve of Spee or compensation-curve.
- The organization of teeth in a curve means a reduction in space mesio-distally.
- The straight occlusion of fossil hominids are much longer mesio-distally and leads to a different profile and different orientation and force vectors of masticatory muscles.
- (**Fig 8 a, b)**
  [G.-H. Schumacher 1997 and Deutsche Gesellschaft für Kieferorthopädie, DGKFO 1963]

Evolution of the Profile

„Profile of the skulls of a neopaleolithic Predmost III and of a homo sapiens of today's population."

Fig. 8a.1.: Prehistoric profiles

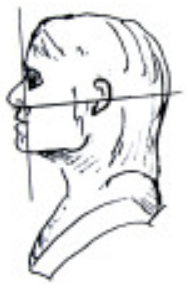


Fig. 8a.2.: Profile Homo Sapiens

Fig. 8a Hypothetic reconstruction after H.F. Osborne, as a support for evolutionary profile analysis, 1. Pithecanthropus erectus 2. Homo neanderthalensis, 3. Homo sapiens (Cromagnon) nach Andresen

Evolution defines a straight occlusion as a characteristic feature for prehistoric fossil hominids.

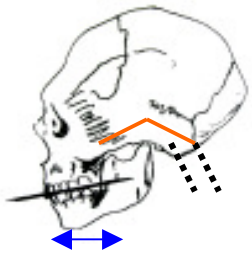


Fig. 8b.1.: Prehistoric straight occlusion

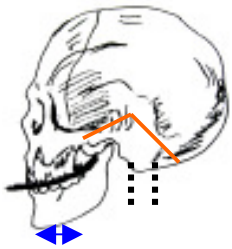


Fig. 8b. 2. curved occlusion of Homo sapiens

The mesio distal length of a straight occlusion is longer in relation to a curved occlusion.
Red angle: The change of the angulation of os sphenoidalis during evolution with resulting changes of functions of masticatory system and head and shoulders

Fig. 8 b: Evolution of Occlusal Curve

"The fossil jaw is characterized by a flat occlusion without a Curve of Spee, which is a young characteristic of racial history. The Curve of Spee can be brought into connection with the heightening of the body of the mandible in combination with mesio-distal reduction of the face." (after Schuricht)

[Reference: P. Andrik, Die Entwicklung der Bissanomalien vom Neolithikum bis zur Gegenwart „Fortschritte der Kieferorthopädie" Bd. 24 H. 1 (1963)]

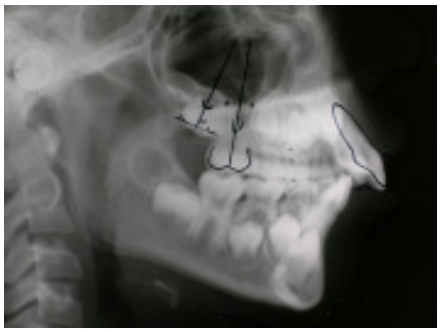
II. A. 4. Development of the occlusion, of tooth angulations and of function during growth,

The upper first permanent molar is the first erupting permanent tooth. His position and his angulation defines the position and the angulations of all later erupting teeth (Domino-effect, G. Risse).

This means:

The angulation of upper first molars is the key and fulcrum of:

- development of functional occlusion, functional occlusion,
- diagnosis and treatment objectives.
- age adapted angulations
- the development of Curve of Spee, including corresponding tooth angulations
- the prime orientation for treatment planning and active treatment (turning back the Domino-effect)
- the inclination of the artificial occlusal plane. [G. Risse]



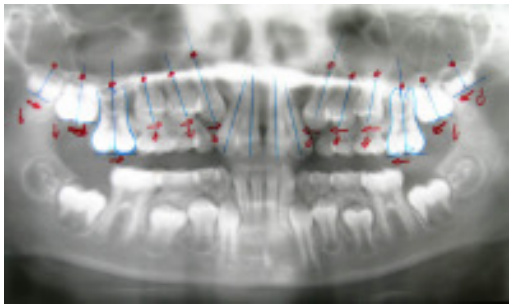


Fig. 9 Demonstration of the angulation of upper first permanent molar as the centre of the Domino-effect for occlusal development of wrong occlusion, occlusal dysfunction and development of CMD/TMD.
The angulation of maxillary 1st permanent molars, being the first erupting permanent teeth, the key of occlusal development and function or dysfunction [G. Risse]

Case with a slight class II division 1, with a mesial drift / tipping of upper teeth with loss of space for canines

Functional Tooth angulation in relation to age

Fig. 10 a, Age 6,
upper first molar: angulation –17°

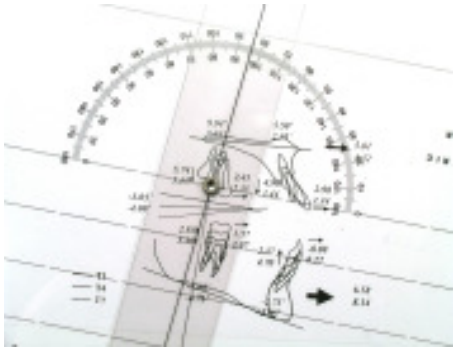


Fig.10 b, Age 12,
upper first molar: angulation –7°

[Transition of molar relationships in different skeletal growth patterns, 2002, Am. J. Ortho., Kim et al and implant studies of Björk and Skiller]

The age adapted angulation, a.a.a

Age adapted angulation of upper 1st molars:

- 17° degrees at an age of 6 years
- 10° degrees at an age of 10 years
- 5° degrees at an age of 18 years

[with range in relation to skeletal patterns, G. Risse]

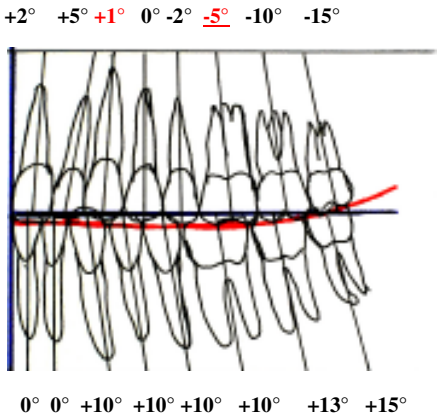


Fig. 11 Tooth Angulations and Curve of Spee, adult
Textbook Anatomy and of Bio Functional Orthodontics, BFO

Part II B

Group - B - The Official Orthodontic Doctrine

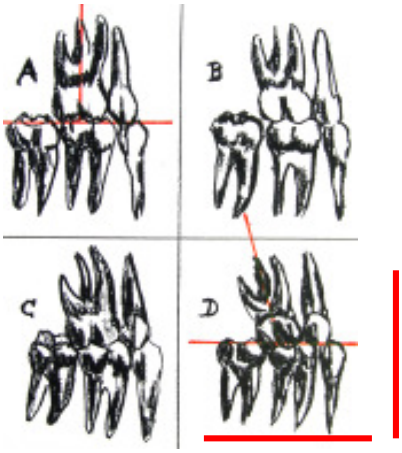
Textbook Anatomy of occlusion in General Orthodontics and Straight Wire Orthodontics

- A result of studies of 120 so called ideal plaster models – by L.F. Andrews -

II. B. 1.

Key - I - of Andrews / Textbook theory in general orthodontics

"The distal marginal ridge of the maxillary first molar must occlude with the mesial marginal ridge of the mandibular second molar." **Fig 12a. / D**



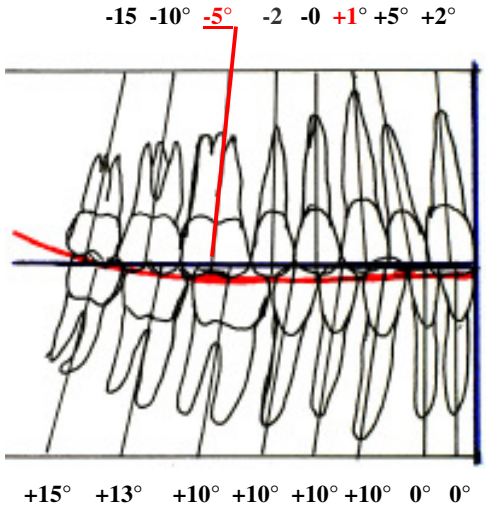


Fig. 12a, L.F. Andrews, Key I : Angulation of upper 1st molar: **+ 15°**

Fig. 12 b: Textbook anatomy Angulation of upper 1st molar: **- 5°**

Discussion

- By this definition of official Orthodontic Theory, the upper first molars would have an axial angulation of **+15°**, see **Fig. 12a, D**
- Official Anatomy defines **–5°** for maxillary molars – meaning a difference of **20° (!)** in relation to Key I of Straight Wire Anatomy with + 15° degrees.
- Key -II- of Andrews on the other hand defines an angulation of maxillary 1st molars of +5°, meaning still a difference of 10° to defined angulation in Key -I-.
- With a length of approximately 2cm of the upper first molar, a mesial rotation of 10° makes a mesial positioning of the crown of 5mm, mostly causing unnecessary tooth extractions.(One Phase Orthodontics)
- The inclination of upper first molars by Key – I – and Key – II – implicates an extrusion of its distal cusp, being a severe interference during lateral actions, easily causing bruxism , TMD, CMD and parodontal diseases, see **Fig. 15c and Fig 15d [B. Koeck]**
- Key - I - : A severe functional problem in relation to the doctrines of Functional Anatomy and Theory of General Dentistry - for diagnosis and orthodontic treatment objectives.

The misleading Angulation of Key - I –

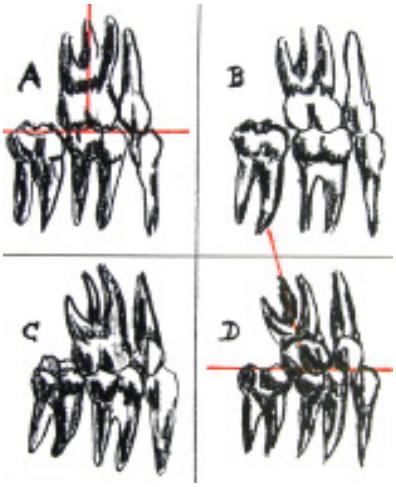


Fig 12 c:
the clinical view of **Key - I - D** in Contemporary orthodontics

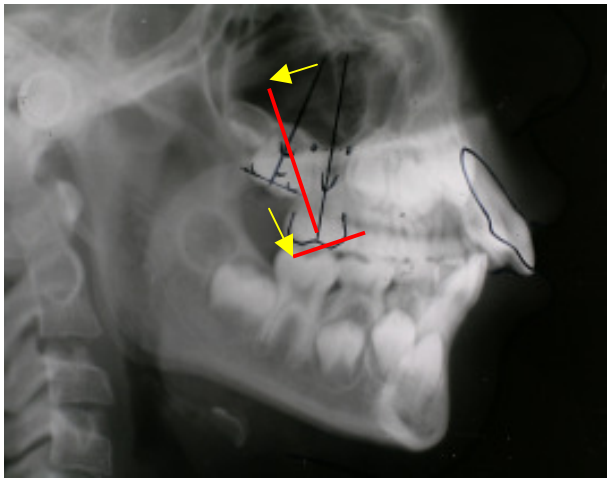


Fig. 12 d:
- unrealistic root rotation against 2nd and 3rd upper molar by Key I and II
- prominent distal cusp of upper 1st molar with occlusal interference by Key I and II

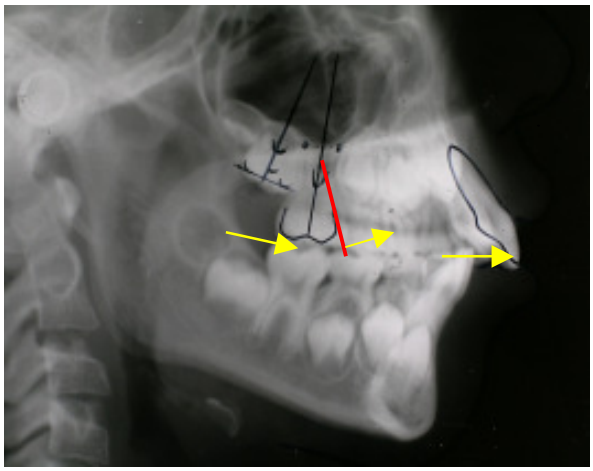


Fig. 12 e: realistic mesial rotational moments by Key I and Key II of straight-wire - Ni-Ti- levelling arches.

Consequences

- Tooth extractions for front retraction after protrusion of upper dentition by straight wire levelling arches - complex orthodontic malpractice, see cases **Fig. 18 and 19**
- The mesial angulated upper molar causes a prominent distobuccal cusp, a classical traumatic factor during action and a prime factor for TMD, CMD and complex parodontal diseases, see **Fig.: 15c, 15d, 16a,16b, 17**. [Koeck B., Fuhr K., Reiber T.: Funktionsstörungen des Kauorgans,1995, Urban-Schwarzenberg, p.100]

II. B. 2

Key - II – L.F. Andrews and Theory of contemporary orthodontics

"Key II states that the angulation of the facial axis of every clinical crown should be positive. The extent of angulation varies according to tooth type."

Key - VI - L.F. Andrews and Theory of contemporary orthodontics

" A flat to slightly concave Curve of Spee and mandibular core line bare the proper occlusal surfaces for optimal occlusion."

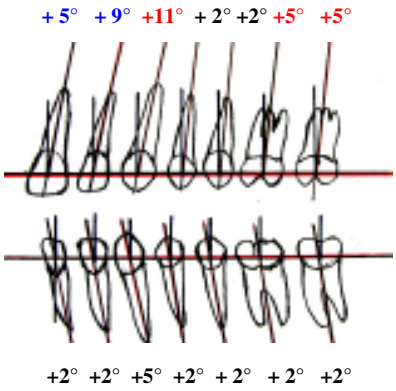


Fig. 13 Key II and VI of Andrews, and general orthodontic doctrine
Note the angulation of maxillary molars

The two opposing definitions:

G,.H. Schumacher

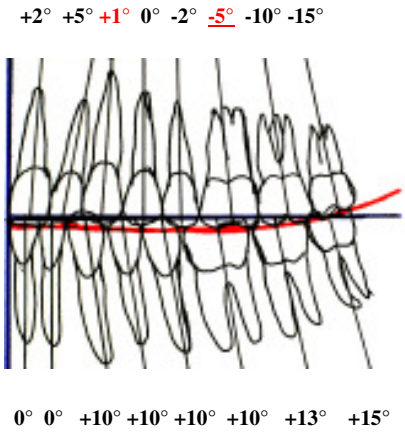


Fig.14 official doctrine in Functional Anatomy, General dentistry and Bio-Functional Orthodontics

L.F. Andrews

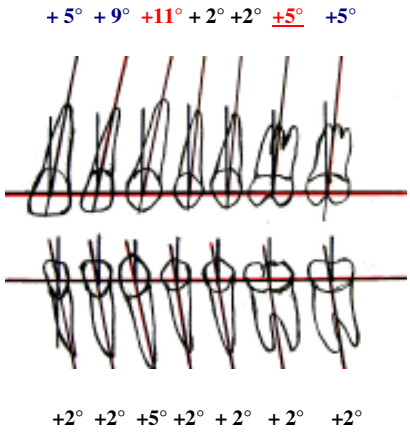


Fig. 15
Doctrine in general orthodontics

Note the different tooth angulation of upper 1st molars between Official Anatomy and Contemporary orthodontics (straight wire orthodontics): **10°**

Conclusions of Part I and Part II

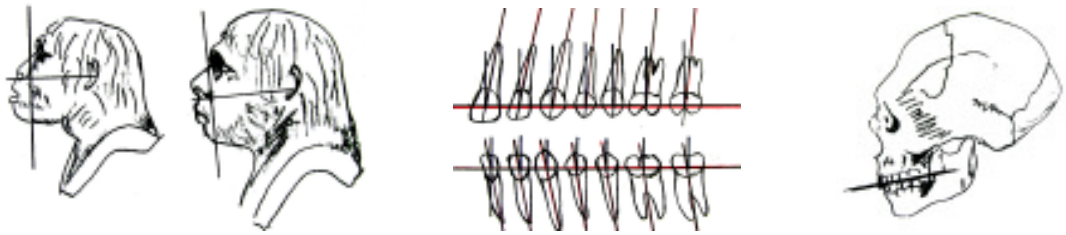


Fig. 15a: Visualization of treatment goals of contemporary orthodontics:
Treatment goals of prehistoric occlusion with diagonal force vector of muscles on straight occlusion and upper molars, a complex malpractice.

- Treatment goals of contemporary orthodontics and straight wire orthodontics, a medical disaster
- Treatment objectives of contemporary orthodontics are prehistoric and out of time.
- The straight wire technique of contemporary orthodontics is neglecting evolution and is treating a prehistoric straight occlusion, disturbing all kinds of normal growth and function, is protruding maxillary dentition, often followed by unnecessary tooth extractions and / or by surgary, repairing the worst, see **Fig. 18c und 19b** .
- Wrong angulated teeth and a straightened Curve of Spee, a cause of complex dysfunction
- Straight wire orthodontics of contemporary orthodontics are preconditions for complex malpractice and complex aftereffects of Craniomandibular Dysfunction, CMD.
- Officials in orthodontic training and education are responsible for malpractice and aftereffects by teaching straight wire orthodontics and straight wire anatomy.